Amendments to the Claims

This listing of claims will replace all prior versions, and listing, of claims in the application.

Listing of Claims:

1. (CURRENTLY AMENDED) A device for detecting near field electromagnetic signals, comprising a strip array antenna, wherein the strip array antenna includes:

a plurality of conductors arranged so a long axis of each is in parallel and spaced from each other<u>, each conductor forming an independent detector element of the strip array antenna;</u> ~~and~~

<u>a ground plane that is arranged so that each of the plurality of conductors is spaced from one side of the ground plane; and</u>

wherein a length of each conductor is set so as to substantially reduce coupling of a signal in one of the plurality of conductors to an adjacent conductor(s) independent of the spacing between adjacent conductors.

2. (ORIGINAL) The detection device of claim 1, wherein the length of each conductor is set so as to be equal to be about $n\lambda/4$, where n is an integer ≥ 1 and λ is the wavelength of the signal to be detected.

3. (ORIGINAL) The detection device of claim 1, wherein a number of parallel conductors comprising the strip array antenna is one of 4 or more conductors, 16 or more conductors, or 32 or more conductors.

4. (ORIGINAL) The detection device of claim 1, wherein a number of parallel conductors comprising the strip array antenna is in the range of one of the ranges of from about 4 to about 16 conductors, from about 4 to about 32 conductors or from about 16 to about 32 conductors.

5. (CURRENTLY AMENDED) The detection device of claim 1, further comprising an encapsulation member, wherein~~:~~

the encapsulation member includes:

a substrate, on one surface of which is disposed the plurality of conductors, and

~~a ground plane that is disposed on an opposing surface of the substrate, and~~

an overlay that covers the conductors disposed on the substrate~~; and~~ and

the ground plane is disposed on an opposing side of the substrate.

6. (ORIGINAL) The detection device of claim 5, wherein the substrate and the overlay are made of a material having a dielectric constant so the wavelength of the electromagnetic wave on the each conductor is reduced so as to be in a desired range.

7. (ORIGINAL) The detection device of claim 6, wherein the dielectric constant of the substrate and overlay material is in the range of from about 6 to 9.6.

8. (ORIGINAL) The detection device of claim 6, wherein the ground plane is configured to keep EMF on each conductor in a quasi-TEM mode.

9. (ORIGINAL) The detection device of claim 1, wherein each of the conductors is terminated in a manner so that the electromagnetic wave on each of the conductors is one of a standing wave or a traveling wave.

10. (ORIGINAL) The detection device of claim 9, further comprising a termination mechanism operably connected to one end of each conductor and configured so as to terminate each of said one end as one of a short or an open.

11. (ORIGINAL) The detection device of claim 9, wherein one end of each conductor is terminated with a resistive match and wherein n is an even integer.

12. (ORIGINAL) The detection device of claim 1, further comprising a signal guard mechanism being arranged so that the guard mechanism isolates at least a portion of the strip array antenna from external EMF interference.

13. (CURRENTLY AMENDED) The detection device of claim 12, wherein the guard mechanism comprises a plurality of guard elements, where a guard element is disposed in

proximity to each end of the strip array antenna to isolate at least the ends of the strip array antenna.

14. (CURRENTLY AMENDED) The detection device of claim 12, wherein the guard mechanism comprises a plurality of guard elements, where a guard element is disposed along and in proximity to each side of the strip array antenna to isolate at least sides of the strip array antenna.

15. (ORIGINAL) The detection device of claim 12, wherein the guard mechanism is disposed in proximity to each end of the strip array antenna and along and in proximity to each side of the strip array antenna to isolate ends and sides of the strip array antenna.

16. (ORIGINAL) The detection device of claim 12, wherein the guard mechanism is electrically grounded.

17. (ORIGINAL) The detection device of claim 1, wherein the strip array antenna further includes an encapsulation member in which is disposed the plurality of conductors and wherein a spacing (s) between adjacent conductors and a height (h) of the encapsulation member is set so a ratio s/h satisfies the relationship $s/h \geq 2.5$.

18. (ORIGINAL) The detection device of claim 17, wherein the ratio s/h satisfies the relationship s/h ≥ about 3.

19. (CURRENTLY AMENDED) The detection device of claim 17, wherein the encapsulation member includes:

a substrate, on one surface of which is disposed the plurality of conductors, <u>and</u>

~~a ground plane that is disposed on an opposing surface of the substrate, and~~

an overlay that covers the conductors disposed on the substrate~~;~~<u> and</u>

<u>wherein the ground plane is disposed on an opposing surface of the substrate</u>.

20. (CURRENTLY AMENDED) A device for detecting near field electromagnetic signals, comprising a strip array antenna, wherein the strip array antenna includes:

X conductors arranged so a long axis of each is in parallel and spaced from each other, where X is an integer ≥ 2<u>, each of the X conductor forming an independent detector element of the strip array antenna</u>;

wherein a length of each conductor is set so to be equal to be about $n\lambda/4$, where n is an integer ≥ 1 and λ is the wavelength of the signal to be detected, thereby substantially reducing coupling of a signal in one of the X conductors to an adjacent conductor(s) independent of the spacing between adjacent conductors;

an encapsulation member, wherein the encapsulation member includes:

a substrate, on one surface of which is disposed the X conductors,

a ground plane that is disposed on an opposing surface of the substrate,

an overlay that covers the X conductors disposed on the substrate, and

wherein the substrate and the overlay are made of a material having a dielectric constant so the wavelength of the electromagnetic wave on each conductor is reduced so as to be in a desired range; and

wherein each of the X conductors is terminated in a manner so that the electromagnetic wave on each of the X conductors is one of a standing wave or a traveling wave.

21. (ORIGINAL) The detection device of claim 20, wherein X is one of 4 or more, 16 or more, or 32 or more.

22. (ORIGINAL) The detection device of claim 20, wherein X is in the range of one of the ranges of from about 4 to about 16, from about 4 to about 32 or from about 16 to about 32.

23. (ORIGINAL) The detection device of claim 20, wherein the dielectric constant of the substrate and overlay material is in the range of from about 6 to 9.6.

24. (ORIGINAL) The detection device of claim 20, further comprising a termination mechanism operably connected to one end of each conductor and configured so as to terminate each of said one end as one of a short or an open.

25. (ORIGINAL) The detection device of claim 20, wherein one end of each conductor is terminated with a resistive match and wherein n is an even integer.

26. (ORIGINAL) The detection device of claim 20, further comprising a signal guard mechanism being arranged so that the guard mechanism isolates at least a portion of the strip array antenna from external EMF interference.

27. (ORIGINAL) The detection device of claim 26, wherein the guard mechanism is disposed in proximity to each end of the strip array antenna and along and in proximity to each side of the strip array antenna to isolate ends and sides of the strip array antenna and wherein the guard mechanism is electrically grounded.

28. (ORIGINAL) The detection device of claim 20, wherein a spacing (s) between adjacent conductors and a height (h) of the encapsulation member is set so a ratio s/h satisfies the relationship $s/h \geq 2.5$.

29. (ORIGINAL) The detection device of claim 28, wherein the ratio s/h satisfies the relationship $s/h \geq$ about 3.

30. (CURRENTLY AMENDED) A near field electromagnetic signal detection apparatus, comprising:

a strip array antenna and Y receivers, where Y is an integer ~~≥ 2~~ ≥ 1;

wherein the strip array antenna includes:

X conductors arranged so a long axis of each is in parallel and spaced from each other, where X is an integer ≥ 2 and where each of the X conductors forms an independent detector element of the strip array antenna, ~~and~~

a ground plane that is arranged so that each of the X conductors is spaced from one side of the ground plane, and

wherein a length of each conductor is set so as to substantially reduce coupling of a signal in one of the X conductors to an adjacent conductor(s) independent of the spacing between adjacent conductors; and

wherein the Y receivers are operably coupled to the X conductors so as to receive output signals from the X conductors.

31. (ORIGINAL) The detection apparatus of claim 30, wherein the length of each conductor is set so as to be equal to be about $n\lambda/4$, where n is an integer ≥ 1 and λ is the wavelength of the signal to be detected.

32. (ORIGINAL) The detection apparatus of claim 30, further comprising Y switches, one for each receiver and being operably coupled thereto, where the Y switches are configured so

as to decouple the Y receivers and X conductors when an excitation electromagnetic signal is being generated and to couple the Y receivers and X conductors when an excitation electromagnetic signal is not being generated.

33. (ORIGINAL) The detection apparatus of claim 30, wherein X = Y.

34. (ORIGINAL) The detection apparatus of claim 33, wherein X is one of 4 or more, 16 or more, or 32 or more.

35. (ORIGINAL) The detection apparatus of claim 33, wherein X is in the range of one of the ranges of from about 4 to about 16, from about 4 to about 32 or from about 16 to about 32.

36. (ORIGINAL) The detection apparatus of claim 30, further comprising a termination mechanism operably connected to one end of each conductor and configured so as to terminate each of said one end as one of a short or an open.

37. (ORIGINAL) The detection apparatus of claim 30, wherein each conductor is terminated with a resistive match and wherein n is an even integer.

38. (ORIGINAL) The detection apparatus of claim 30, wherein the strip array antenna further includes an encapsulation member in which is disposed the plurality of conductors and wherein a spacing (s) between adjacent conductors and a height (h) of the encapsulation member is set so a ratio s/h satisfies the relationship s/h ≥ 2.5.

39. (ORIGINAL) The detection apparatus device of claim 38, wherein the ratio s/h satisfies the relationship s/h ≥ about 3.

40. (CURRENTLY AMENDED) An MRI excitation and detection apparatus to scan a region of an object comprising:

a near field electromagnetic signal detection apparatus positioned to detect MRI signals from the region being scanned;

an excitation signal generation apparatus that generates and transmits electromagnetic signals at an excitation frequency into the region being scanned; and

wherein the near field electromagnetic signal detection apparatus, comprises:

a strip array antenna,

Y receivers, where Y is an integer ~~≥ 2~~ ≥ 1,

wherein the strip array antenna includes:

X conductors arranged so a long axis of each is in parallel and spaced from each other, where X is an integer ≥ 2 and where each of the X conductors form an independent detector element of the strip array antenna, ~~and~~

~~a ground plane that is arranged so that each of the X conductors is spaced from one side of the ground plane, and~~

wherein a length of each conductor is set so as to substantially reduce coupling of a signal in one of the X conductors to an adjacent conductor(s) independent of the spacing between adjacent conductors, and

wherein the Y receivers are operably coupled to the X conductors so as to receive output signals from the X conductors.

41. (ORIGINAL) The MRI excitation and detection apparatus of claim 40 further comprising a control mechanism operably coupled to the near field electromagnetic signal detection apparatus and the excitation signal generation apparatus and configured so as to selectively control the transmission of signals by the excitation signal generation apparatus and the reception of MRI signals by the near field signal detection apparatus so that each occurs at predetermined times.

42. (CURRENTLY AMENDED) An MR imaging system to scan a region of an object, comprising:

a near field electromagnetic signal detection apparatus positioned to detect MRI signals from the region being scanned;

an excitation signal generation apparatus that generates and transmits electromagnetic signals at an excitation frequency into the region being scanned;

wherein the near field electromagnetic signal detection apparatus, comprises:

a strip array antenna,

Y receivers, where Y is an integer ≥ 2,

wherein the strip array antenna includes:

X conductors arranged so a long axis of each is in parallel and spaced from each other, where X is an integer ≥ 2 and where each of the X conductors forms an independent detector element of the strip array antenna, ~~and~~

a ground plane that is arranged so that each of the X conductors is spaced from one side of the ground plane, and

wherein a length of each conductor is set so as to substantially reduce coupling of a signal in one of the X conductors to an adjacent conductor(s) independent of the spacing between adjacent conductors, and

wherein the Y receivers are operably coupled to the X conductors so as to receive output signals from the X conductors; and

an image reconstruction device, operably coupled to the near field electromagnetic signal detection apparatus that processes the detected MR signals and provides an output representative of the reconstructed image.

43. (ORIGINAL) The MRI imaging system of claim 42 further comprising a control mechanism operably coupled to the near field electromagnetic signal detection apparatus and the excitation signal generation apparatus and configured so as to selectively control the transmission

of signals by the excitation signal generation apparatus and the reception of MRI signals by the near field signal detection apparatus so that each occurs at predetermined times.

44. (ORIGINAL) The MRI imaging system of claim 43 further comprising:

a main magnetic coil that generates a homogenous magnetic in each slice;

gradient coils that generate at least one additional magnetic field; and

wherein the controller mechanism further controls the operation and energization of the main and gradient coils.

45. (CURRENTLY AMENDED) A method for detecting near field electromagnetic signals from a region, comprising the steps of:

providing a strip array antenna that includes:

______ X conductors arranged so a long axis of each is in parallel and spaced from each other, where X is an integer ≥ 2 and where each of the X conductors forms an independent detector element of the strip array antenna, and

a ground plane that is arranged so that each of the X conductors is spaced from one side of the ground plane; and

setting a length of each conductor to substantially reduce coupling of a signal in one of the plurality of conductors to an adjacent conductor(s) independent of the spacing between adjacent conductors.

46. (ORIGINAL) The method of claim 45, further comprising the step of positioning the strip array antenna so as to receive the electromagnetic signals from the region.

47. (ORIGINAL) The method of claim 45, wherein said setting includes setting the length of each conductor so as to be equal to be about $n\lambda/4$, where n is an integer ≥ 1 and λ is the wavelength of the signal to be detected.

48. (ORIGINAL) The method of claim 47, further comprising the step of terminating each of the X conductors in a manner so that the electromagnetic wave on each of the conductors is one of a standing wave or a traveling wave.

49. (ORIGINAL) The method of claim 48, wherein said terminating includes terminating one end of each conductor as one of a short or an open.

50. (ORIGINAL) The method of claim 48, wherein said terminating includes terminating one end of each conductor with a resistive match and wherein n is set to be an even integer.

51. (ORIGINAL) The method of claim 45, further comprising the step of isolating at least a portion of the provided strip array antenna from external EMF interference.

52. (ORIGINAL) The method of claim 45, wherein the provided strip array antenna further includes an encapsulation member in which is disposed the X conductors having a height (h), wherein adjacent conductors are spaced from each other a distance (s) and wherein said method further includes:

setting the height (h) and spacing distance (s) so that a ratio s/h satisfies the relationship $s/h \geq 2.5$.

53. (ORIGINAL) The method of claim 52, wherein the ratio s/h satisfies the relationship $s/h \geq$ about 3.

54. (CURRENTLY AMENDED) The ~~detection device~~ method of claim 52, wherein the provided encapsulation member includes:

a substrate, on one surface of which is disposed the X conductors,

~~a ground plane that is disposed on an opposing surface of the substrate, and~~

an overlay that covers the conductors disposed on the substrate; and

wherein the ground plane is disposed on an opposing surface of the substrate.

55. (CURRENTLY ADDED) The detection device of claim 2, wherein the lengths of the plurality of conductors is the same.

56. (CURRENTLY ADDED) The detection device of claim 20, wherein the lengths of the X conductors is the same.

57. (CURRENTLY ADDED) The detection apparatus of claim 30, wherein Y equals 1, and the one receiver is configured so as to include a plurality or more of input channels and wherein each of the X conductors is operably coupled to a respective one of the plurality or more of input channels.

58. (CURRENTLY ADDED) The MRI excitation and detection apparatus of claim 40, wherein X = Y.

59. (CURRENTLY ADDED) The MRI excitation and detection apparatus of claim 40, wherein Y equals 1 and the one receiver is configured so as to include a plurality or more of input channels and wherein each of the X conductors is operably coupled to a respective one of the plurality or more of input channels.

60. (CURRENTLY ADDED) The MRI imaging system of claim 42, wherein X = Y.

61. (CURRENTLY ADDED) The MRI imaging system of claim 42, wherein Y equals 1 and the one receiver is configured so as to include a plurality or more of input channels and

wherein each of the X conductors is operably coupled to a respective one of the plurality or more of input channels.

62. (CURRENTLY ADDED) The method of claim 47, wherein said setting includes setting the length of each conductor so as to be the same.